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Environment, Safety, and Health Directorate

EPC-EC

Technical Procedure

Fish Sampling

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REVISION HISTORY

Document Number and Revision *[Include revision number, beginning with Revision 0]*	**Effective Date** *[Document Control Coordinator inserts effective date]*	**Description of Changes** *[List specific changes made since the previous revision]*
EPC-ES-TP-005, Rev. 0	6/20/2016	Renumbered and reformatted to EPC Division. Added clarification on euthanization requirements. Supersedes SOP-5135.
SOP-5135, R0	1/30/08	Renumbered and reformatted to WES Division.
ENV-MAQ-702, R6	5/11/05	Replaced HCP with HR, added euthanization steps, added prerequisite for animal use committee approval, and removed electroshocking steps and attachments.
ENV-MAQ-702, R5	5/12/04	Updated and reformatted document to conform with MAQ procedures.
ENV-MAQ-702, R4	4/03	Team name change to Environmental Surveillance.
ENV-MAQ-702, R3	4/02	Added new text regarding electrofishing procedures.
ENV-MAQ-702, R2	4/01	Added new Section 9.0, Training.
ENV-MAQ-702, R1	3/99	Reformatted in accordance with LIR300-00-01, Safe Work Practices.
ENV-MAQ-702, R0	6/28/96	New Document.

Table of Contents

1.0 PURPOSE AND SCOPE

The purpose of this procedure is to describe the collection of fish samples from rivers and reservoirs as part of the Soil, Foodstuffs, and Biota (SFB) Monitoring Program. This procedure applies to the individual(s) assigned to collect fish as part of the SFB Monitoring Program.

2.0 BACKGROUND AND PRECAUTIONS

2.1 Background

This document establishes the basic requirements for collecting samples of bottom-feeding and predator-feeding fish upstream and downstream of Los Alamos National Laboratory (LANL). LANL personnel will perform the work described in this procedure only after reading this procedure for course credit and completing the required training specified in section 2.2.

Samples are collected from two categories of fish:

- Predator feeders: rainbow trout, brown trout, kokanee salmon, largemouth and smallmouth bass, pike, white crappie, walleye, etc.
- Bottom feeders: white sucker, channel catfish, carp, carp suckers, etc.

Fish samples are collected at two locations with respect to LANL property:

- Upstream (or background):
  - Rio Grande from the Otowi Bridge north
  - Reservoirs (Abiquiu dam, Heron dam, and/or El Vado dam)
- Downstream:
  - Rio Grande from the Otowi Bridge south, specifically below Los Alamos Canyon.
  - Reservoirs (Cochiti dam)

2.2 Precautions

Three (3) people, minimum, and four (4) people, maximum, are required to go out in the field—one driver and two to three people to place nets and collect and process fish. All individuals participating in fish sampling on the water must know how to swim well.

The following documents must be obtained before sample collection begins:

- A permit for scientific collection from the New Mexico Department of Game and Fish. The application form, Scientific Collecting Application to Take Protected Wildlife for Scientific Purposes, is available online from the New Mexico Department of Game and Fish at http://www.wildlife.state.nm.us/download/enforcement/scientific-educational/scientific/Scientific-Collection-Permit-Application-Form.pdf.

- An animal use protocol approved by the LANL Institutional Animal Care and Use Committee available online at https://irm.lanl.gov/forms/Shared/2014.pdf (Form 2014).
- An approved integrated work document ([IWD] See LANL procedure P300, Integrated Work Management, for guidance in preparing an IWD).

3.0 EQUIPMENT AND TOOLS

- First-aid kit and sunscreen,
- Cellular telephone and/or radio,
- Rubber gloves that cover the forearm,
- Rubber boots to knee,
- Safety glasses (polarized sunglasses),
- Boat shoes or similar soft-soled shoes with good grip on wet surfaces,
- Life vest for each individual,
- Hat,
- Ice chest with blue ice,
- Sharp knife and Kevlar® safety gloves for use with knife,
- Large animal guillotine,
- Wooden blocks,
- Dissecting needles,
- Clean water for processing fish,
- Pontoon boat,
- Ziploc® sample bags or equivalent (1-gallon size),
- Large trash bags,
- Marker for labeling bags,
- Fishing equipment (gill nets, rods-and-reels),
- Chain-of-Custody (COC) forms,
- Digital camera,
- For organic analysis only: pre-labeled amber glass screw-top jars,
- For organic analysis only: Fish Collection Locations and Physical Characteristics form (Attachment 1).

4.0 STEP-BY-STEP DESCRIPTION

4.1 Preparatory Activities

Sampler or Field Team Leader (FTL):

1. Obtain COC forms and labels from the Sample Management Office. In general, prepare to collect from 5 to 10 samples (3 lb each; may require compositing) from each source.
2. To collect fish from the Rio Grande, use a rod and reel. To collect fish from the reservoirs, use the pontoon boat and gill nets. The sampler must have a thorough knowledge of the workings of the boat.

   Note: Since fishing is conducted on a triennial basis, the boat motor on the boat should be serviced by a professional and should be in good working order before field operations.
3. Check the condition (including fuel levels) of the vehicle, trailer, and boat before leaving for the field.
4. Identify a point of contact to provide pertinent information of destination, expected time in, and methods of notifying the field team.
5. Notify the group office to place you on travel status when leaving Los Alamos County.
6. Ensure you have a working cell phone and a pager.

4.2 Fish Harvesting

Note: Every institution that uses animals for federally funded laboratory research must have an institutional animal care and use committee (IACUC). An approved IACUC protocol is necessary for all use of vertebrate animals in research at LANL. Protocols are approved for 3 years and need to be renewed every 3 years.

The most recent American Veterinary Medical Association Guidelines for the Euthanasia of Animals, 2013 Edition, state that "field research on fish takes place in a complex environment that must be understood by both researchers and their respective IACUC. Field research is frequently conducted on a scale comparable to commercial fishing, often with the same equipment, boats, and personnel. The large number of finfish, limited boat space, adverse environmental conditions, and personnel safety concerns may justify use of harvest techniques that may not meet the criteria for euthanasia, but in all situations, pain and distress should be minimized to the greatest extent possible."

For LANL research, we collect fish from two reservoirs and at many points along the Rio Grande where equipment must be packed in and out. Therefore, whenever possible, we will make every attempt to euthanize the fish according to IACUC protocols. However, there may be situations where adverse environmental conditions or other hazards may be encountered (lighting, high winds, extreme heat, etc.), necessitating leaving the collection site quickly and/or seeking shelter. In these cases, personnel safety must come first and euthanization of all the fish may not be possible. This decision is made by the person in charge identified in the IWD.

Sampler or FTL:

1. After arriving at your sampling destination (e.g., Rio Grande or reservoir), identify several sampling locations.

   Note: For Rio Grande sampling, background samples are usually collected upstream of the Otowi bridge and samples potentially impacted by Laboratory operations are collected downstream of the Otowi bridge below the Los Alamos Canyon confluence with the Rio Grande.

2. Collect Rio Grande samples by rod and reel as follows:

   - Use rod and reel with bait.
   - Euthanize fish (stun, decapitate, double pith), remove entrails, clean with water, package in Ziploc® bags and place in cooler with ice.

3. Collect reservoir samples with gill nets as follows:

   - Set gill nets by first anchoring one end of the net to a fixed point (e.g., a partially submerged tree).
   - Stretch the net and attach a weight to the bottom of the net and a float to the top part of the net. This weight/float system is effective for maintaining proper positioning of the net.
   - Set sample nets at three or four random locations.

     Note: It usually takes about three to four nets to catch the appropriate number of fish.

   - Return to the net location no more than 24 hours later, carefully raise the net from the water (avoid entangling the net), and remove fish from the net.
   - Euthanize fish or place all live fish into a holding tank with water until fish can be euthanized.

4. Collect as many species as possible.

   Note: It takes about 3 lb of fish to make one sample; thus, compositing fish may be necessary to obtain one sample for radionuclide analyses.

5. Euthanize fish that are still alive after all the fish have been collected:

   - Stun the fish by clubbing them on the head with a small wooden bat.
   - Wearing Kevlar® gloves, decapitate the fish using a large animal guillotine (4-inch opening).
   - Double pith (sever the spinal cord in both the body and decapitated head with a dissecting needle).

6. Prepare samples as follows:

   - On shore, divide the fish by species and composite fish (3 lb per sample) to obtain samples.
   - Clean fish (remove viscera and rinse with clean water).
   - Place cleaned fish samples in Ziploc® (or equivalent) bags labeled with sampling location and date.

Note 1: For radionuclide analysis, about 5 to 10 composite fish samples per site are adequate for analysis.

Note 2: For metals analysis, use one fish fillet per sample; place fish fillet in Ziploc® (or equivalent) bag. The other side of the fish may be used for polychlorinated biphenyl samples. (See specific instructions in section 4.3 below).

- Pack the fish on ice for transport back to LANL.
- After processing the samples, bag all fish parts not used in the analysis and dispose at the Los Alamos area landfill. Do not place fish parts into any dumpster.

7. Complete a COC form with the appropriate sampling information. Maintain proper COC on the samples. See section 4.4, Maintaining Custody of Samples.
8. Obtain an X and Y coordinate for every sample location.
9. Clean the net and neatly roll it for storage.
10. Once back at LANL, store the samples in a freezer until they are submitted for analysis.

4.3 Organic Analysis Sampling

Sampler or FTL:

1. Pick out fish from each location that are of even size (and age), depending on the types and amounts of fish collected.
2. Place fillet (plus skin) into pre-labeled 500-mL amber screw-top jars.
3. Fill out COC form with appropriate sampling information. Maintain proper COC on the samples. See section 4.4, Maintaining Custody of Samples.
4. Place samples into ice-filled chest for transport to LANL.
5. Once back at LANL, keep the samples cool or frozen and in the dark until submittal to the analytical laboratory.
6. After processing the samples, bag all fish parts not used in the analysis and dispose at the Los Alamos area landfill. Do not place fish parts into any dumpster.

4.4 Maintaining Custody of Samples

Sampler or FTL:

1. Document COC for all samples used to demonstrate compliance.
2. Verify the possession and handling of samples is traceable at all times.

Note: A sample is considered in custody if one of the following conditions is met:

- The sample is in one's physical possession,
- The sample is in one's view after being in one's physical possession,

- The sample is in one's physical possession and then locked up so that no one can tamper with it, or
- The sample is kept in a secure area where access is restricted to authorized and accountable personnel only.

A secured area is an area that is locked (e.g., a room, cooler, vehicle, or refrigerator).

3. Use a custody seal to secure the area or the sample container if the area cannot be secured.

4.5 Transferring Custody of Samples

Sampler or FTL:

Complete the "relinquished by/received by" and "date" sections of the form whenever samples are transferred into the custody of another person or organization.

Note: These sections of the form must provide a complete history of custody of the samples from collection to transfer to the analytical laboratory.

4.6 Documenting Broken Chain-of-Custody

Sampler or FTL:

1. Whenever there is a break in the COC of a sample, document the failure by initiating a deficiency report in accordance with P322-4, Laboratory Performance Feedback and Improvement Process.
2. Document the occurrence, evaluate the potential impact (if any) on the samples, and propose a fix to prevent recurrence.

4.7 Emergency Actions to Take in the Event of Injury

Sampler or FTL:

1. Perform first aid for cuts, as appropriate.
2. Provide first aid for all injuries and see that the injured person is taken to Occupational Health (only if immediate medical attention is not required) or to the nearest hospital.
3. Notify the individual's supervisor and group office as soon as possible.

5.0 TRAINING

At least one person in each field crew must have the following training:

- Boating safety class and boating license approved by the New Mexico State Parks Department (https://www.boat-ed.com/newmexico/?utm_source=bing&utm_medium=cpc&utm_campaign=Boat_New_Mexico_2015&utm_term=%2BBoat%20%2BSafety).

At least two people in each field crew must have the following training:

- First aid
- Cardiopulmonary resuscitation (CPR).

All Individuals are required to be trained in the following before performing this procedure:

- General Field Safety Self Study (ENV-DO-QP-100; UTrain Course 45777),
- New Mexico Boat Laws and Regulations (https://www.boat-ed.com/newmexico/boating_law.html),
- IWD (Work Activity #0013759).

6.0 RECORDS

Sampler:

Submit the following records generated by this procedure to the FTL:

- Completed COC form
- Fish collection locations and physical characteristics

7.0 REFERENCES

American Veterinary Medical Association, Guidelines for the Euthanasia of Animals: 2013 Edition

Los Alamos National Laboratory, Laboratory Performance Feedback and Improvement Process, Los Alamos National Laboratory document P322-4 (Effective date: April 21, 2016)

From: Hollis, Diana J
Sent: Wednesday, June 22, 2016 2:43 PM
To: Maestas, Pamela Therese
Subject: RE: DC review

Unclassified and within DUSA ENVPRO scope.

Diana

From: Maestas, Pamela Therese
Sent: Wednesday, June 22, 2016 9:05 AM
To: Hollis, Diana J <dhollis@lanl.gov>
Subject: DC review

Hi Diana,
Can you do a DC review for me on the attached procedure (EPC-ES-TP-005)? It's one of many that we have to post to the EPRR.
Thank you.

Pamela T. Maestas
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